MODIS Land C6

Robert Wolfe
NASA GSFC Code 614.5

MODIS &VIIRS Science Team Meeting
May 14, 2008

C6 Straw-man Time-line

May 2008	List of L1 C6 changes defined
June 2008	List of Land C6 changes defined and a straw-man C6 plan developed
June/July 2008	Period for community comment/review on proposals
July to Dec 2008	Science tests of C5 Atmos. and Land products with C6 L1 software
Sept to Dec 2009	Delivery of Land C6 algorithms
Oct 2008 to June 2009	Science testing of Land C6 algorithms
Jan 2009	Start C6 L1 production with current C5 Atmos and Land algorithms
July 2009	Start of Land C6 reprocessing; @ 16.5X reprocessing would finish July 2010

C6 Questions

Questions to science team members to aid in C6 reprocessing planning

1. What changes (if any) do you feel are important to make to your algorithm?
2. What upstream algorithm changes would your algorithm benefit from? Also, what upstream changes would necessitate a reprocessing for your algorithm?
3. Based on 1 and 2, what are the significant scientific benefits from a C6 reprocessing for your algorithm?
4. Are there any other changes, such as product format changes, that are also needed? Why?

Answers in "MODIS Land C6 Planning v6 rw.doc"

(my summary follows)

C6 Answer Highlights (1/6)

1. Surface Reflectance (Vermote)
   - Continuous aerosol QA flag
   - Improvement to clouds and shadows (with LDOPE)
   - BRDF coupling in aerosol retrieval and surface reflectance
   - 8-day BRDF corrected reflectance (with gap fill)
2. Vegetation Indices (Huete)*
   - Improved temporal frequency and temporal gap filling
   - Better snow/ice and inland-water handling
   - Strengthen backup EVI2 algorithm and adjust VI (negative) range
3. BRDF/Albedo (Schaaf)
   - Improve backup algorithm
   - Improve quality fields and move to L2G-lite
   - Optional: 2 bands @ 250m and 4-day frequency (based on 16-days)

** Funding dependent*

C6 Answer Highlights (2/6)

4. LAI/FPAR (Ranga)*
   - (none planned)
5. Net Photosynthesis (Zhao/Running)
   - Biome-Look-UP-Table (BPLUT) update
   - Finer spatial resolution GMAO data
6. Vegetation Continuous Fields (Carroll/Townsend)
   - Changes dependent on any Surf. Refl. changes and final C5 VCF product (will finish next summer)
7. Burned Area (Roy/Justice)
   - Include active Fire product
   - Any improvements to Surf. Refl.

** Funding dependent*

C6 Answer Highlights (3/6)

8. Land Cover/Dynamics (Friedl)
   - Land Cover
     - Migrate to hieratical LCCS compliant classification scheme
     - Stabilize classification across years
     - Improve difficult classes
   - Land Dynamics
     - Move to 250m product (see NBAR)
     - Use 8-day product
     - Improved snow screening and gap filling
     - Asymmetric sigmoid fitting
9. Thermal Anomalies/Fire (Giglio/Csiszar)
   - Refine internal cloud mask – heavy smoke
   - Fix false alarms in Amazon
   - Fix scan edge cloud/water confusion with Fire (obscure bug)

C6 Answer Highlights (4/6)

10. Snow/Sea-ice (Hall)
    - Collaborate with BU to improve snow albedo
    - Create a “cloud-free” product (gap filled)
    - Improved use of cloud mask
11. Land Surface Temperature (Wan)
    - Remove cloud contaminated values from L2 (in addition to L3) product
    - Update LUT for split-window algorithm (focus on arid and semi-arid regions)
    - Improve land-cover based emissivities (focus on barren areas)

C6 Answer Highlights (5/6)

12. Generic changes (Sadashiva)
    - Use one cloud mask (not both MOD09 and MOD35)
    - Fix L2G-lite and use in downstream algorithms (not L2G(-heavy) or MODAGG)
    - Eliminate 1km products when 500m is available
13. L1B and Geolocation (Wenny/Xiong and Wolfe)
    - See Tuesday material for details
    - L1B
        - Dead detector handling change (fill, not interpolated)
        - A0/A2 update – Thermal bands
        - RVS update (detector dependent)
        - New polarization information (from Oceans; particularly for recent Terra)
    - Geolocation
        - improved terrain correction and 500m geolocation
        - possibly incorporate new L/W mask and 500m terrain model

C6 Answer Highlights (6/6)

14. L2G, L2G-lite (Wolfe)
    - Any fixes needed so L2G-lite can be used with down-stream algorithms (inc. any additional Surf. Refl. fields)
    - Use 500m geolocation in 500m/250m products
15. Alternate Atmospheric Correction (Lyapustin)
    - New algorithm, produces: cloud mask, land/water/snow mask, AOT, QA flags and surface parameters
    - Surface parameters (spectral) include: Li-Sparse Ross Think BRF model; NBRF (similar to NBAR); IBRF (instaneous BRF); albedo
    - Over snow, also: sub-pixel snow fraction and grain size
    - Gap-filled when new observations are not available (i.e. for clouds)
16. Other upstream discipline changes (cloud mask, aerosols, etc.)

    [list of changes needed]